UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/699,985	11/03/2003	Timothy E. Ostromek	46030/P044US/10407181	5305

29053 7590 07/02/2008
FULBRIGHT & JAWORSKI L.L.P
2200 ROSS AVENUE
SUITE 2800
DALLAS, TX 75201-2784

EXAMINER	
KRASNIC, BERNARD	
ART UNIT	**PAPER NUMBER**
2624	
MAIL DATE	**DELIVERY MODE**
07/02/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/699,985	OSTROMEK ET AL.	
	Examiner	Art Unit	
	BERNARD KRASNIC	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 February 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,8-13 and 15-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6, 8-13, and 15-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The amendment filed 2/08/2008 have been entered and made of record.

2. The Applicant has canceled claim(s) 7 and 14.

3. The application has pending claim(s) 1-6, 8-13, and 15-18.

4. In response to the amendments filed on 2/08/2008:

The "Claim rejections under 35 U.S.C. 101" have been entered and therefore the Examiner withdraws the rejections under 35 U.S.C. 101.

5. Applicant's arguments filed 2/08/2008 have been fully considered but they are not persuasive.

The Applicant alleges, "1. Claims 1, 2, 4-9, and 11-16 …" in pages 9-11, and states respectively that the Office Action does not show that the claims are obvious because neither Spight nor Clune teach a metric being generated from their respective optical transformed light signals and that a suggestion of placing Clune's steps 210-216 after Spight's Fourier transform lens would not create a predictable result because Spight operates in the optical light frequency domain whereas Clune operates in the digital spatial domain [Clune operates with electrical inputs and outputs whereas Spight operates with light paths]. The Examiner disagrees because it is not the intent of the

obviousness rejection proposed by the Examiner to include Clune's steps 210-216 after Spight's Fourier transform but rather to show that the two systems are relatively the same in that both have two Fourier transforms to transform image information, both have yield processor correlations to process the transformed information, both have inverse Fourier transforms, and both display the processed results; the two systems are relatively the same except that Clune operates in the digital domain whereas Spight operates in the light path domain. The Examiner firstly would like to clarify the rejection by stating that Clune's initial display means 262 and 276 [which are between Clune's relative Fourier transforms and yield processor correlation 278] are suggested to be placed between Spight's Fourier transform lens and yield processor correlation. The Examiner had and has stated in the obvious rejection "it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Spight's method by using Clune's teachings *by including a first and second metric generator between Spight's optical transform and Spight's yield processor in order to display the image after being transformed to improve the validation for the correction of a misalignment between at least two images/signals* (see Clune, Figs. 2A and 2B-2, col. 5, lines 63-67)". Therefore this initial pre-display means [these pre-displays which are after each Fourier transform are considered to be producing the metrics] would just allow the user to visually see the differences between the initial image information and the correlated processed image information for validation for the correction of misalignment. Such an adjustment to include pre-displays [these pre-displays which are after each Fourier transform are considered to be producing the metrics] is

predictable because it is well known in the art at the time of the invention to go from the light path domain to the digital domain and vise versa by using sensors and processors. The reference Spight even shows that going from the light path domain to the electrical digital domain is relatively easily done by using sensors and processors (*see Spight, col. 2, line 68, col. 3, lines 1-6*). Therefore using Clune's teachings of the pre-display means 262 and 276 of Figure 2B-2 along with Spight's showing that the optical light path could be displayed using sensors and processors, it definitely would be obvious to include Clune's pre-display means [these pre-displays which are after each Fourier transform are considered to be producing the metrics] between Spight's Fourier transforms lens and yield processor in order to display the image after being transformed to improve the validation for the correction of a misalignment between two images/signals. Also, the broadest reasonable claim language interpretation doesn't preclude going from analog / light path domain to digital / electrical domain and back. The Applicant's themselves in the specification [see specification, page 6 line 29 through page 7 line 5] state that the sensor and processor between the optical transform and the yield processor may be digital or analog signals which further agrees with the Examiner's obviousness rejection. Therefore the claims are still not in condition for allowance because they are still not patentably distinguishable over the prior art references.

The Applicant alleges, "2. Claims 17 and 18 …" in page 11, and states respectively that the limitations of claim 17 are not disclosed by the prior art references because no signal is generating from an optically transformed light based on a sensor

and processor. However the Examiner disagrees because as stated above, using Clune's teachings of the pre-display means 262 and 276 of Figure 2B-2 along with Spight's showing that the optical light path *could be displayed using sensors and processors*, it definitely would be obvious to include Clune's pre-display means [these pre-displays which are after each Fourier transform are considered to be producing the metrics from sensors and processors] between Spight's Fourier transforms lens and yield processor in order to display the image after being transformed to improve the validation for the correction of a misalignment between two images/signals. Therefore claim 17 and dependent claim 18 are still not in condition for allowance because they are still not patentably distinguishable over the prior art references.

The Applicant alleges, "C. Claims 3 and 10 ..." in page 12, and states respectively that claims 3 and 10 depend from claims 1 and 8 which inherit deficiencies which are not suggested by Spight in view of Clune and therefore the combination of Spight in view of Clune and further in view of Evans is likewise improper. The Examiner disagrees because as discussed above, the obviousness rejection of Spight in view of Clune is maintained since the obviousness rejection is believed to be proper and therefore the rejection on claims 3 and 10 is also maintained.

The Applicant alleges, "D. Spight ..." in page 12, and states respectively that the Office presents arguments that Spight teaches each limitation but presents a 35 U.S.C 103 rejection instead of a 35 U.S.C. 102 rejection. The Examiner disagrees because the 35 U.S.C. 103 obvious rejections clearly states that Spight does not specifically [explicitly] disclose generating the first metric in accordance with the first optically

transformed light and generating the second metric in accordance with the second optically transformed light.

Therefore claims 1-6, 8-13, and 15-18 are still not in condition for allowance because they are still not patentably distinguishable over the prior art references.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 1-2, 4-6, 8-9, 11-13, and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spight et al (US 4,462,046, as applied in previous Office Action) in view of Clune et al (US 7,187,810 B2, as applied in previous Office Action). Re Claim 1: Spight discloses a method / machine vision system for processing image information (see Fig. 1, title of invention, col. 1, lines 46-49 and 67-68), comprising receiving light / incoherent light signals (11, 13) or coherent light signals (o(x,y) and r(x,y)) comprising image information / scene information (see Fig. 1, col. 2, lines 35-57, col. 4, lines 27-28 and 44-45); performing a first optical transform / Fourier Transform via an optical lens system (30) on the light to yield a first optically transformed light / Fo(x,y) (see Fig. 1, col. 2, lines 50-57, col. 4, lines 27-37); performing a second optical transform / Fourier Transform via an optical lens system (32) on the light to yield a second optically transformed light / IR(x,y) (see Fig. 1, col. 2, lines 50-57, col. 4, lines

43-50); processing the first metric and the second metric to yield a processed metric / square sum of IR(x,y) and Fo(x,y) (see Fig. 1, col. 2, lines 50-64, col. 4, lines 56-63, col. 5, lines 2-19); and performing an inverse optical transform / Inverse Fourier Transform via an optical lens system (36) on the processed metric to process the image information of the light (see Fig. 1, col. 2, lines 64-68, col. 3, lines 1-6, col. 4, lines 42-48), generating an image from the processed metric (see col. 2, line 68, col. 3, lines 1-6); and displaying / monitor (200, 40) the image (see Figs. 1 and 4, col. 3, lines 1-6).

However, Spight does not specifically disclose generating the first metric in accordance with the first optically transformed light and generating the second metric in accordance with the second optically transformed light.

Clune discloses generating the first metric / Fi(u,v) 2D data array matrix (262) in accordance with the first optically transformed light / Fast Fourier Transform FFT (260) [Spight teaches the first optical transformed light which is similar to Clune's first digital Fast Fourier Transform FFT] and generating the second metric / Fj(u,v) 2D data array matrix (276) in accordance with the second optically transformed light / Fast Fourier Transform FFT (274) [Spight teaches the second optical transformed light which is similar to Clune's second digital Fast Fourier Transform FFT] (see Clune, Figs. 2A and 2B-2, col. 11, lines 40-67, col. 12, lines 1-29). Clune also yields a processed metric (278) from the first (262) and second (276) metric and performs an inverse transform (280) [Spight teaches the inverse optical transform which is similar to Clune's digital Inverse Fast Fourier Transform iFFT] on the processed metric (278) similar to Spight (see Clune, Figs. 2A and 2B-2, col. 11, lines 40-67, col. 12, lines 1-29).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Spight's method by using Clune's teachings by including a first and second metric generator between Spight's optical transform and Spight's yield processor in order to display the image after being transformed to improve the validation for the correction of a misalignment between at least two images/signals (see Clune, Figs. 2A and 2B-2, col. 5, lines 63-67).

Re Claim 2: Spight further discloses the first optical transform / Fourier Transform via an optical lens system (30) is substantially similar to the second optical transform / Fourier Transform via an optical lens system (32) (see Fig. 1, col. 2, lines 54-57, both the optical lens systems perform Fourier transform).

Re Claim 4: Spight further discloses the first optical transform comprises a first Fourier transform / Fourier Transform via an optical lens system (30); and the second optical transform comprises a second Fourier transform / Fourier Transform via an optical lens system (32) (see Fig. 1, col. 2, lines 54-57, both the optical lens systems perform Fourier transform).

Re Claim 5: Spight further discloses selecting first data / Fo(x,y) from the first metric; selecting second data / IR(x,y) from the second metric; and fusing / square sum of IR(x,y) and Fo(x,y) the first data and the second data to yield the processed metric / square sum of IR(x,y) and Fo(x,y) (see Fig. 1, col. 2, lines 50-64, col. 4, lines 56-63, col.

5, lines 2-19). Clune also further discloses selecting first data / Fi(u,v) from the first metric (data array of 262), selecting second data / Fj(u,v) from the second metric (data array of 276); and fusing / cross correlation (278) the first data / Fi(u,v) and the second data / Fj(u,v) to yield the processed metric / correlated output of 278 (see Clune, Figs. 2A and 2B-2, col. 11, lines 40-67, col. 12, lines 1-29).

Re Claim 6: Clune further discloses generating the processed metric / correlation (218, 278) in response to the first metric (data array of 262) and the second metric (data array of 276); and detecting a target / measure of misalignment using the processed metric / correlation (218, 278) (see Clune, Figs. 2A and 2B-2, col. 11, lines 65-67, col. 12, lines 1-11, the cross correlation 278 fuses or correlates [product] the two data array's of 262 and 276 to detect / determine a target / measure of misalignment).

As to claims 8-9 and 11-13, the claims are the corresponding system claims to claims 1-2 and 4-6. The discussions are addressed with regard to claims 1-2 and 4-6.

As to claim 15, the claim is the corresponding means plus function system claim to claim 1. The discussions are addressed with regard to claim 1. The newly amended recited limitation "means for reporting results" in claim 15 is understood to be the displaying means of claim 1 respectively.

The limitations, as recited in claim 15, "means for receiving light" in line 3, "means for performing" in lines 5 and 7, "means for generating" in lines 9 and 11,

"means for processing" in line 13, and "means for performing" in line 15, "means for reporting" in line 16, invoke 35 USC 112, 6th paragraph.

Re Claim 16: The limitation "a procedure selected from the group of a first procedure and a second procedure" is referred to as a Markush group and this Markush group recites choosing either the first procedure or the second procedure to process the first metric and the second metric. Therefore, while considering the first procedure for fusing and considering wherein the first optical transform is substantially similar to the second optical transform, all the limitations respectively are analyzed and taught by Spight, as modified by Clune, in the same manner as Spight, as modified by Clune, taught claims 1-2, 4-6 above.

As to claim 17, the claim is the corresponding system claim to claim 1 respectively. The discussions are addressed with regard to claim 1. To briefly further clarify the teachings of the system components: Spight teaches the first (30, see Spight, Fig. 1) and second (32, see Spight, Fig. 1) optical transformers; Clune teaches the first sensor and first processor (262, see Clune, Fig. 2B-2, 262 senses the transformed data and processes the data into a data matrix array for displaying purposes); Clune teaches the second sensor and second processor (276, see Clune, Fig. 2B-2, 276 senses the transformed data and processes the data into a data matrix array for displaying purposes); Spight and Clune each teach a processor for forming a fused image (34, see Spight, Fig. 1, fusion is done by a summation processor) (278, see Clune, Fig. 2B-2,

fusion is done by a correlation processor); Spight and Clune each teach an inverse transformer (36, see Spight, Fig. 1) (280, see Clune, Fig. 2B-2); Spight teaches a display (200, see Spight, Fig. 4).

The result of the Spight and Clune combination would be completely predictable in that this digital type system would still produce a correlation degree between the two signals/images. Furthermore, one skilled in the art would be motivated to utilize this updated computer implemented system because it is more stable and cost effective over an analog type system. The obviousness rationale advanced hereinabove is consistent with the criteria articulated in *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007).

Re Claim 18: Spight further discloses wherein said first (30) and second (32) optical transforms are selected from the group consisting of: a Fourier transform / Fourier transform (see Fig. 1, col. 2, lines 54-57, both the optical lens systems perform Fourier transform); and a geometric transform.

8. Claims 3 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Spight, as modified by Clune, as applied to claims 1 and 8 above, and further in view of Evans et al (US 5,537,669, as applied in previous Office Action). The teachings of Spight as modified by Clune have been discussed above.

Re Claim 3: Spight further discloses the first optical transform / Fourier Transform via an optical lens system (30) is compatibly different from the second optical transform / Fourier Transform via an optical lens system (32) (see Fig. 1, col. 4, lines 33-37).

Although the compatibly different limitation is silent in Spight, it is an inherent feature because each of the two lenses 30 and 32 could have a different focal length making them compatibly different. As discussed in the rejection for claim 3, the Fourier transform lenses 30 and 32 [see Spight, Fig. 1] are compatibly different because no two lenses could be exactly the same, there will always be some type of micro-difference if no bigger difference could be noticed. This little difference between the two Fourier transform lenses 30 and 32 results in two "compatibly different" Fourier transforms. Lens 30 is used as the first optical transform [Fourier Transform via lens] and lens 32 is used as the second compatibly different [lenses compatibly different by structure] optical transform [Fourier Transform via lens].

However, Spight as modified by Clune, don't specifically disclose that the first and second optical transforms each target different aspects of the image information [they teach that the same spectrum is targeted using the same Fourier Transform].

Evans discloses wherein the first transform / Fourier transform (6, see Evans, Fig. 1, col. 4, lines 49-51) is compatibly different from the second transform / Canonical transform (6', see Evans, Fig. 1, col. 4, lines 49-51), such that the first and second transforms each target different aspects / different spectral results of the image information (see Evans, col. 4, lines 49-51, each of the two different transforms produce different spectral results which show that different spectral aspects of the image are

targeted) [Spight teaches the first and second optical transform which is similar to Evans first and second digital Fourier-like Transforms].

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to further modify Spight, as modified by Clune, using Evans' teachings by including to Spight's first and second optical transforms the ability to target and analyze different spectral aspects of the image by using the Canonical and Fourier transforms in order to further improve the misalignment or offsets of the inputted images (see Evans, col. 2, lines 57-64).

As to claim 10, the claim is the corresponding system claim to claim 3. The discussions are addressed with regard to claim 3.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Lewis et al discloses a pattern recognition system, Taylor discloses an adaptive pattern recognition system.

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bernard Krasnic whose telephone number is (571) 270-1357. The examiner can normally be reached on Mon-Thur 8:00am-4:00pm and every other Friday 8:00am-3:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571) 272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jingge Wu/
Supervisory Patent Examiner, Art Unit 2624
Bernard Krasnic
June 26, 2008